TECHNICAL PROJECT MANAGEMENT PLAN, URBAN STORMWATER MANAGEMENT EVALUATION FOR SELECTED URBAN AREAS, LAKE TAHOE BASIN

LAKE TAHOE, CALIFORNIA AND NEVADA

EXECUTIVE SUMMARY

The protection of Lake Tahoe's water quality and environment has been a national priority since the creation of the Tahoe Regional Planning Agency through Congressional approval of the Tahoe Regional Planning Compact in 1969 (P.L. 91-148, 83 Stat. 360). Federal commitment to preserving this national treasure was reaffirmed by a presidential summit in 1997 which resulted in the passage of the Lake Tahoe Restoration Act authorizing $300 million in federal funds.

Stormwater and other surface water runoff have been shown to be a significant contributor of pollutants and to the loss of clarity in Lake Tahoe's waters (USDA, 2000). A variety of actions are being taken to reduce this pollutant source including treatment of stormwater runoff which is the focus of this document. Comprehensive master planning is not currently being utilized for stormwater runoff in the Lake Tahoe basin.

This Project Management Plan (PMP) has been prepared to identify scopes of work, estimated costs, and schedule for completing activities to address some of the key issues relating to urban stormwater management in the Lake Tahoe basin. Current conditions strongly support a renewed focus on stormwater management problems especially within urbanized areas in the basin and to explore innovative alternatives for urban stormwater management.

The Corps developed this PMP reflecting input received from potential sponsors, both at the executive and staff level. The primary direction was to focus the work of this PMP on the following two aspects of urban stormwater management within the Lake Tahoe basin:

- Assess the current status of urban stormwater master planning in the Lake Tahoe basin in comparison to state-of-the-art within the industry
- Evaluate site specific best management practices (BMPs) issues as identified by non-Federal study partners in the projected 3-4 study areas

Numerous activities relating to urban stormwater management are underway within the Lake Tahoe basin. Prior to actual implementation of this PMP for any specific urban area, an additional review of current and proposed activities regarding urban stormwater in the Lake Tahoe basin will be completed to prevent redundancy between this PMP and the other activities.

This PMP may be utilized to execute the evaluation in each of four distinct urban areas in Lake Tahoe. The evaluation in each distinct urban area can be executed independently or in concert.

Task 1 through Task 5 for each distinct urban area will evaluate an evaluation will be performed on the current state of stormwater master planning in Lake Tahoe for comparison with industry standards, identifying gaps in the current plans, and making recommendations on future master planning steps. Tasks 6 through Task 11 for each distinct urban area will include a detailed evaluation on either of two options regarding regional BMPs (option chosen at the discretion of the non-Federal Sponsor) in each of the four distinct urban areas.

For the purposes of this PMP, regional BMPs are defined as those BMPs that will be located to treat runoff from an entire drainage area(s) and that will be planned, designed, constructed, operated, and maintained by the responsible agency and paid for with public funds. The purpose of the regional BMPs is to provide highly effective systems that overcome space and other identified constraints associated with the implementation of more traditional BMPs such as basins or constructed wetlands.

An evaluation and specific recommendations on regional BMPs for selected watersheds reflecting constraints, cost, or treatment efficiency will be conducted for option one of Task 6 through Task 11. For option two, an evaluation will be performed on non-traditional BMPs (chemical addition for enhanced settling, filtration, etc.) and specific recommendations will be made on improving BMPs for selected watersheds where site characteristics preclude traditional approaches. Finally, a report on these evaluations and recommendations will be issued under Task 12. Local agency input and in-progress review will be available through a series of meetings and intermediate technical memoranda.

While the evaluation will be focused on regional BMPs for public agency management of stormwater, the results will be equally applicable to commercial properties, as appropriate. The results of this PMP will provide a basis for requesting and allocating funds and resources, and for identifying commitments between the federal and non-federal participants.

This Urban Stormwater Management Plan is a portion of the Lake Tahoe Framework Implementation Report that Congress directed the US Army Corps of Engineers to complete. The Framework Report will present alternatives for improvement of environmental quality at Lake Tahoe by enhanced implementation of projects. Basin Stakeholders identified the effort presented in this Management Plan as a critical missing element to presenting any alternatives for improvement of environmental quality.

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LAKE TAHOE, CALIFORNIA AND NEVADA

1.0 TECHNICAL PROJECT MANAGEMENT PLAN

1.1 Background

The Lake Tahoe basin is a complex ecosystem with 63 individual watersheds and 52 intervening zones (USDA, 2000). Intervening zones are generally found between the individual watersheds. These intervening zones are found around the lake and drain directly to the lake without first entering streams. Many of these intervening zones are located in the urban areas of South Lake Tahoe, Tahoe City and Incline Village. See Figure 1 for the locations of these intervening zones. Figure 2 shows the urban area within the watersheds.

The loss of about one foot per year of clarity in Lake Tahoe's waters during the past 30 years is well documented (Goldman, 1974; USDA, 2000; TRG, 2001). Increased nutrient and sediment loadings, due to development and other human activity, are stimulating algal growth and increasing the concentration of fine suspended particles thus decreasing clarity in Lake Tahoe. Major pathways through which these pollutant loads are transported to the lake include:

- Surface water and groundwater discharge
- Atmospheric deposition
- Shoreline erosion

It may take up to thirty years to see changes in the clarity that result from immediate reductions of nutrients going into Lake Tahoe. Some scientists have concluded that if the buildup of nutrients in the lake is not reversed within the next ten years, the costs of solving the problem will be so great and the impacts so extreme that they will exceed the currently available capacity for resolution (USDA, 2000).

Table 1 illustrates the large relative annual contribution of nutrients from direct runoff is derived from estimated water and nutrient budgets presented in The Lake Tahoe Watershed Assessment (USDA, 2000).

Table 1. Relative Annual Water and Nutrient Contributions to Lake Tahoe

Source	Flow (into Lake Tahoe) (%)	Total Nitrogen (%)	Total Phosphorus (%)
Stream runoff	57	20	29
Direct Runoff (from intervening zones)	7	10	34
Ground Water	< 1	14	9
Shorezone Erosion	NA	< 1	1
Precipitation (Atmospheric Deposition)	36	56	27

These percentages are acknowledged to be initial estimates and it is recognized that further study is needed to more accurately quantify pollutant contributions of direct, or more specifically, direct urban runoff from these intervening zones. However, results of long-term monitoring performed under the Lake Tahoe Interagency Monitoring Program (LTIMP) since 1988 (Rowe et al, 2002) also indicate a higher relative nutrient contribution from urban runoff. Urban areas have therefore been given a high priority for treatment.

Several public agencies are responsible for managing stormwater in the Lake Tahoe basin. These responsibilities include design, construction, maintenance, and the monitoring of stormwater collection, conveyance, and treatment facilities. These agencies are:

- State transportation departments (Nevada Department of Transportation and California Department of Transportation)
- Local counties (Placer, El Dorado, and Washoe)
- City of South Lake Tahoe
- Round Hill and Kingsbury General Improvement Districts
- Homeowners Associations
- Sanitation Improvement Districts

Public agencies are also responsible for regulating stormwater in the Lake Tahoe basin, including establishing numerical discharge limits. These agencies include:

- Tahoe Regional Planning Agency - TRPA (CA and NV)
- Lahontan Regional Water Quality Control Board (CA)
- Nevada Division of Environmental Protection (NV)

Public water quality improvement projects are implemented through the TRPA's Environmental Improvement Program (EIP). Agencies providing funding, technical oversight, and planning for these projects, which include urban stormwater management practices, are:

- TRPA
- California Tahoe Conservancy
- Nevada Division of State Lands
- United States Forest Service
- Nevada Tahoe Conservation District

WATERSHEDS AND INTERVENING ZONES

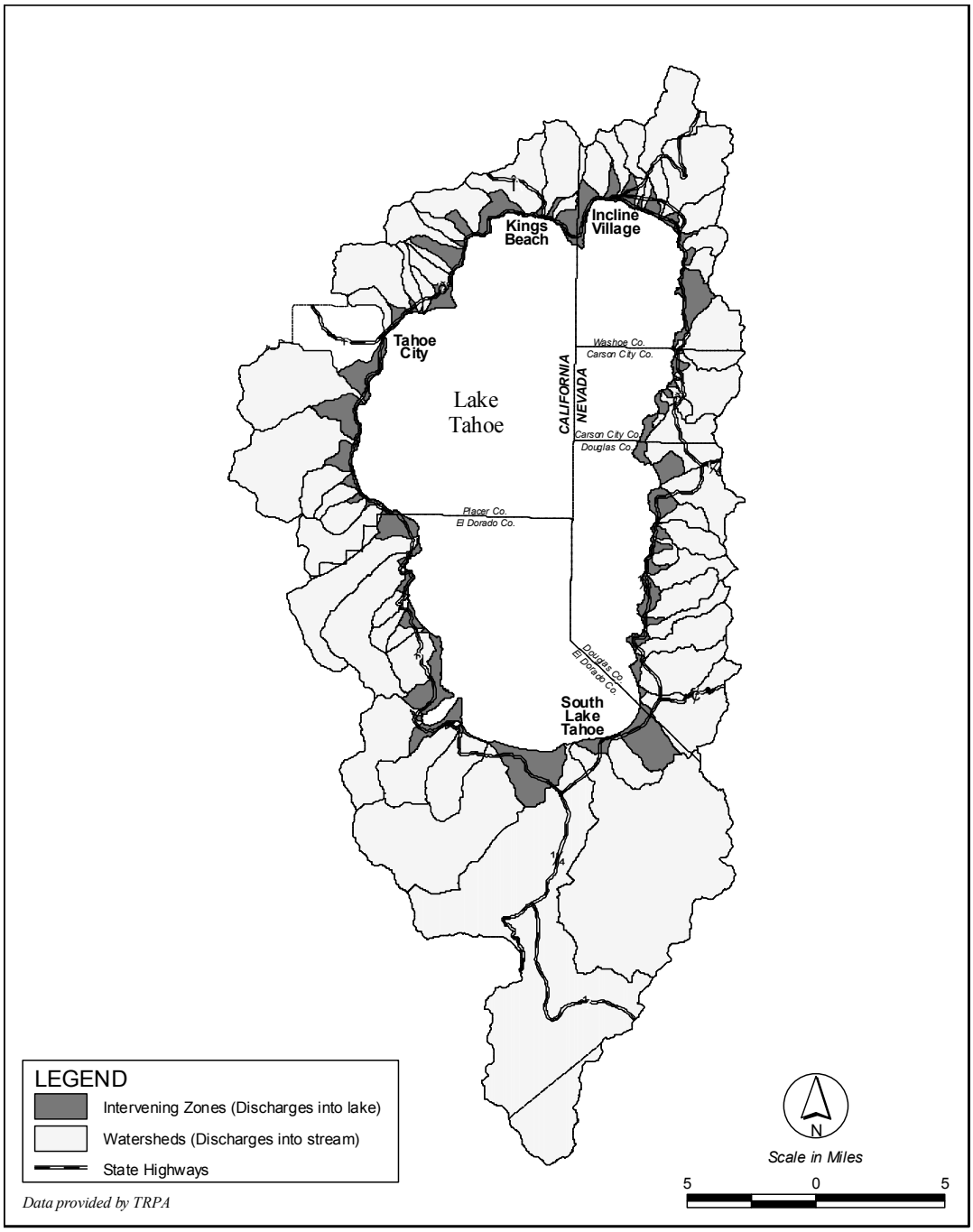

Figure 1
LAKE TAHOE BASIN
WATERSHEDS AND INTERVENING ZONES

MAP OF WATERSHED AND URBAN AREAS

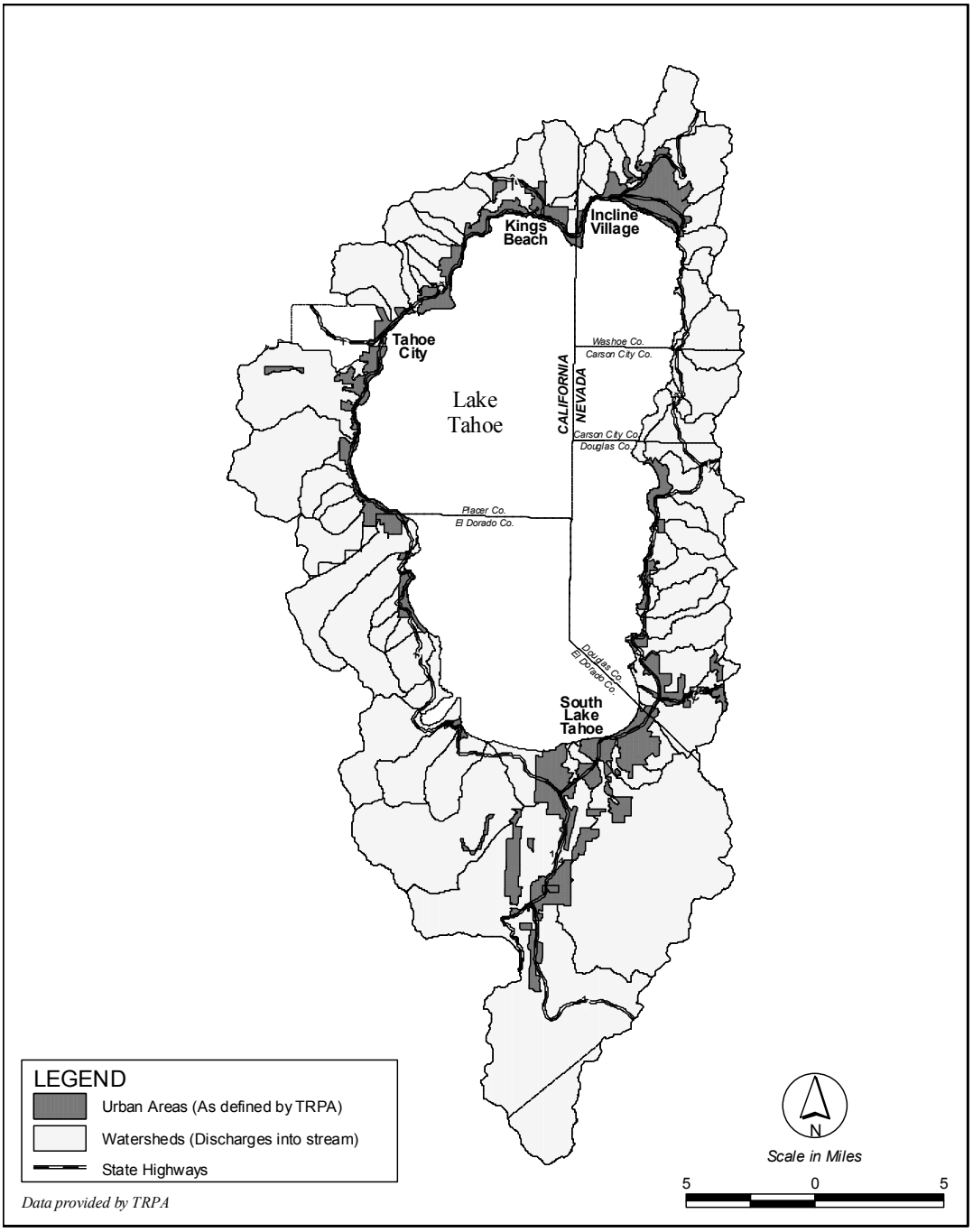

Figure 2
LAKE TAHOE BASIN
WATERSHEDS AND URBAN AREAS

Monitoring and research programs are conducted by entities listed above and contracted consultants. Additionally, university level research, including several long-term studies, relevant to Lake Tahoe stormwater, has been conducted by:

- University of California, Davis-Tahoe Research Group
- Desert Research Institute
- United States Geological Survey

Improved urban stormwater management is a common goal concerning the stakeholders in the Lake Tahoe basin. Key issues, which when addressed, would facilitate achieving their goals include:

- Need for common understanding and coordination between current and planned stormwater management activities
- Need for common understanding and agreement upon criteria used for the design, construction, operation and maintenance of storm drainage and water quality facilities.
- Common understanding of the need for comprehensive urban stormwater master planning
- Need for urban stormwater management plans for selected watersheds which focuses on traditional regional BMPs and non-traditional regional BMPs were required due to site constraints

1.2 Project Goals

The project goals are to evaluate current urban stormwater management activities, assess alternative approaches to regional BMPs, and development of a preliminary action plan for selected urban watersheds within the Lake Tahoe basin.

1.3 Project Tasks

Task 1 – Compile and Review Urban Stormwater Information and Activities

Numerous activities relating to urban stormwater management have been completed and/or are currently underway within the Lake Tahoe basin. Information pertinent to urban stormwater management will be collected and reviewed. These materials could include urban stormwater monitoring reports, applicable laws, regulations, ordinances, and descriptions of current and planned activities. Where available and applicable, summaries of previous work will be reviewed in lieu of a review of detailed analysis and project histories. The purpose of the review will be to obtain information necessary to complete this study and to avoid duplication of efforts with other activities.

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 1 and at Workshop No. 1.

Task 2 – Assess Existing Urban Stormwater Master Plans

This task will assess the urban stormwater master plans of the agencies responsible for managing stormwater in the Lake Tahoe basin, including a comparison to industry standards. Using the results of Task 1 and working closely with agency personnel, descriptions will be developed for the following items:

- Overview of Existing and Future Storm Drainage and Water Quality Problems and Needs
- Overview of Existing and Future Capital Improvement and Operation and Maintenance (O&M) Programs
- Overview of Future Urban Stormwater Master Planning Needs

A comparison between master planning activities in the Lake Tahoe basin with other areas will also be conducted.

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 1 and at Workshop No. 1.

Task 3 – Select Urbanized Watersheds for Evaluation of Regional BMPs

The purpose of this task is to identify the urban watersheds that this study will focus on. These watersheds will include those where future regional BMPs are needed, where existing regional facilities are likely ineffective, and/or where site constraints may preclude traditional regional BMPs.

Identification of the selected watersheds will rely heavily upon input from the local agency and the results of field reconnaissance. Criteria for selection and prioritizing watersheds will be established in consultation with agency personnel, water quality scientists, and potential project sponsors. A regional map will be prepared delineating the watershed areas and prioritizing the watersheds of interest within each jurisdiction. For purposes of this scope of work it has been assumed that four urbanized watersheds will be studied in detail. These four locations are:

- South Lake Tahoe
- Tahoe City
- Kings Beach
- Incline Village

Other urban locations may be identified and evaluated if approved by the local agency and by the Corps.

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 1 and at Workshop No. 1.

Task 4 - Compile and Review Storm Drainage Design, Operation, and Maintenance Criteria

This task will produce a comparison of the criteria being applied to the design, operation, and maintenance of regional urban storm drainage facilities. The adequacy of the existing criteria will be discussed with agency personnel and perceived problems will be identified. The purpose of this task will be to establish criteria for use in this study. It is anticipated that this study's criteria will be readily compiled from existing criteria. Work performed within this task will be carefully coordinated with existing efforts by others to refine design approaches within the Lake Tahoe basin.

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 1 and at Workshop No. 1.

Task 5 - Compile and Review Stormwater Quality Related Design, Operation, and Maintenance Criteria

This task will produce a comparison of the criteria being applied to the design, operation, and maintenance of regional urban stormwater quality improvement facilities. The adequacy of the existing criteria will be discussed with agency personnel and water quality scientists. Perceived problems will be identified. The purpose of this task will be to establish criteria for use in this study. It is anticipated that this study's criteria will be compiled from existing criteria. Work performed within this task will be carefully coordinated with existing efforts by others to refine design approaches within the Lake Tahoe basin.

This task will also result in a list of currently accepted BMPs and a set of project summaries describing how these BMPs are used within the projects to improve urban stormwater quality. It will reflect:

- Information documenting the contribution of urban stormwater runoff to the water quality problems of Lake Tahoe
- Information on currently accepted and implemented BMPs used to improve urban stormwater quality and any available information on their effectiveness in Lake Tahoe
- Descriptions of EIP, or other, projects currently in place that focus on improvement of urban stormwater quality and any available information on the overall project effectiveness
- O&M requirements for both individual BMPs and regional BMPs

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 1 and at Workshop No. 1.

Task 6 - Develop Criteria for Identifying BMP Constrained Areas

The BMP constrained areas, as defined in this project, are areas where current regional stormwater management methodologies are of limited effectiveness. A set of criteria will be developed to help identify and prioritize BMP constrained areas. The results will assist in

identifying areas that require alternative approaches to the traditional regional BMPs. This task will draw heavily upon the results of Tasks 4 and 5, and may also include criteria such as:

- Lack of adequate space for the properly sized facilities due to surrounding land use and land capabilities
- Poor site characteristics such as high ground water, "tight" soils (poor infiltration capacity), and steep slope
- Concerns over flooding of nearby underground structures
- Concerns over pollution to drinking water sources (i.e. nearby wells)
- Concerns over negative environmental reports.

Deliverables and Milestones: Technical Memorandum No. 1 (up to 20 pages) will include a summary of the outcome of tasks 2 through 7, with primary focus on recommendations on urban stormwater master planning.

Task 7 - Prepare Study Maps of Selected Watersheds

Mapping for study purposes will be based upon existing information. It is anticipated that mapping information will be available from the current Lake Tahoe GIS database maintained by the TRPA including ortho-photography. Mapping information including topography, soils, depth to ground water, environmentally sensitive areas, land ownership information, and existing stormwater quality and drainage facilities, are of particular interest.

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 2 and at Workshop No. 2.

Task 8 – Evaluate Existing Conditions within Selected Watersheds

This task will provide a basis upon which to develop potential alternatives for improved effectiveness of regional urban stormwater management practices within the selected watersheds. Reconnaissance level field visits to the targeted areas, and interviews with appropriate stormwater agency staff will be used to build on information developed in previous tasks. Key activities will include:

- Locating and inventorying existing regional water quality BMPs
- Assessing O&M activities relative to O&M requirements for the BMPs located in the areas of interest
- Assessing the adequacy of existing drainage facilities based upon discussions with agency staff
- Providing an overall assessment of the adequacy of the existing water quality BMPs based on available effectiveness data, staff interviews, and visual observations.

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 2 and at Workshop No. 2.

Task 9 – Evaluate Future Conditions within Selected Watersheds

In this task the future conditions that may influence methods of regional urban stormwater management in the selected watersheds will be assessed. The results of existing planning documents in conjunction with interviews with stormwater agency staff will be used to gain an understanding of:

- Potential future need to modify or extend the existing storm drain system
- Potential future need for additional regional BMPs
- Potential future locations for these additional facilities
- Potential future O&M requirements for these additional facilities

Deliverables and Milestones: The results of this task will be presented in Technical Memorandum No. 2 and at Workshop No. 2.

Task 10 - Assess Adequacy of Sites and Evaluate Potential Regional BMPs

The potential regional BMP sites identified under Tasks 8 and 9 will be evaluated. The evaluation will consist of screening and selecting a potential traditional BMP for use at each site. A preliminary design and lay out will be completed using a traditional approach, if the site characteristics permit.

During the preliminary design phase, BMP constrained areas will be identified using the criteria established for study purposes. In this task, the constraints on the "traditional" approaches will be reconsidered to aid in the development of alternatives to traditional regional BMPs.

Alternatives to traditional regional BMPs will likely consist of technologies that are not typical of the urban stormwater management field. Preliminary research has identified potential techniques that are similar to conventional drinking water treatment technologies such as coagulation/sedimentation/filtration processes. These emerging technologies may have potential for application in the BMP constrained areas.

It is anticipated that limited hydrologic computer modeling will be completed for this task in order to size the regional BMPs. Significant water quality modeling is not anticipated and the benefits will be assessed using available information.

Activities to be included in this task include:

- Assessing potential regional BMP sites
- Identifying of alternative technologies that may be applicable to constrained regional sites
- Identify possible retrofit opportunities for regional BMPs within selected study area
- Identify a recommended regional BMP for each site
- Preparation of conceptual designs showing layout and estimated size of regional BMPs (traditional and alternative technologies)
- Assessment of O&M requirements for the alternative technologies
- Development of preliminary planning level construction, operation and maintenance cost estimates for the recommended regional BMPs
- Provide general discussion regarding privately owned lands that require BMPs

- Subject to availability of existing GIS data, identify areas within the Lake Tahoe Basin with constraints similar to the constraints being evaluated (e.g. if depth to bedrock being less than six feet is the constraint, identify other areas within the basin, outside of the specific study area, with less than six feet of soil, subject to availability of that data in agency data bases)

Deliverables or Milestones: Technical Memorandum No. 2 (up to 20 pages) will include a summary of emerging technologies related to urban stormwater quality and provide specific recommendations and conceptual designs for regional BMP projects that may be applicable within the targeted areas. A general discussion regarding privately owned BMPs would also be addressed. This will be presented at Workshop No. 2.

Task 11 - Complete General Assessment of Operation and Maintenance Requirements

A general assessment of the operation and maintenance requirements will be conducted at a reconnaissance level. It will draw heavily upon information provided by agency personnel regarding existing and future requirements, problems, and needs. The pros and cons of agencies combining their operation and maintenance activities will be assessed. The results of this task will assess the level of interest in combining operation and maintenance activities and, if an interest exists, will identify the next key activities to further investigate this potential.

Deliverables and Milestones: The results of this task will be presented at Workshop No. 2.

Task 12 – Report – Regional Stormwater BMP Plan for Selected Watersheds

The information developed in Tasks 1 through 12 will be synthesized into a Regional Stormwater BMP Plan for the selected urban watersheds. The recommended plans will present preliminary design and cost estimates for the regional BMPs along with operation and maintenance guidance.

The plan will initially be submitted as a draft allowing for a four-week review period. Comments will then be incorporated into the document, as appropriate, and a comment/response sheet will be generated to address each comment on an individual basis. In addition, a stakeholder workshop will be convened after the initial draft has been distributed (Stakeholder Meeting No.3, Task 1). The purpose of this workshop will be to discuss stakeholder comments on the draft. The report will be finalized reflecting stakeholder comments and direction from the CORPS and delivered to the CORPS in printed (2 copies) and web-compatible format.

Deliverables or Milestones: Draft Action Plan Report (10 printed copies). Comments from the Draft Action plan Report will be addressed at Workshop No. 3. Final Action Plan Report (2 printed copies, one web-compatible file)

Task 13 – Stakeholder Coordination

The contractor will convene and facilitate up to three stakeholder meetings during the project. The purpose of these meetings will be to develop a joint understanding among project stakeholders and work element managers regarding the goals, objectives, and findings of the

project. The meetings will also provide opportunities for input and interaction during the course of the project. These meetings will be held in interactive workshop format with general topics as listed in Table 2.

Table 2. Proposed Stakeholder Workshops

Workshop No.	Recommended Attendees	Proposed Topic(s)
1	Stormwater Stakeholders and Team	Tasks 2 through 7
2	Stormwater Stakeholders and Team	Tasks 8 through 12
3	Stormwater Stakeholders and Team	Task 13

An ongoing technical review process will be coordinated with the Corps and the Scientific Advisor Group (SAG) to provide opportunity for input and maintain a consensus regarding elements of the project. Technical memos and other project deliverables will be submitted to the Corps and the SAG allowing a four-week review and comment period.

Deliverables or Milestones:
Workshop No. 1: Prepare Technical Memorandum No. 1 summarizing the results of Tasks 2 through 7. Present material at workshop and prepare summary notes.
Workshop No. 2: Prepare Technical Memorandum No. 2 summarizing the results of Tasks 8 through 12. Present material at workshop and prepare summary notes.
Workshop No. 3: Review response to comments on the Draft report.

Task 14 - Manage the Project

The contractor will conduct weekly review meetings/phone calls with the Corps, perform quality reviews of the draft technical memoranda and draft and final Action Plan Report by qualified persons other than the person(s) who prepared the report, and manage task order performance quality, timeliness, effectiveness, and conformance with the terms of the Task Order, and the quality and application of the needed resources.

1.4 Deliverables and Milestones

The table below estimates hours of effort and cost for one of the four geographic areas. An economy of scale could be achieved if two or more geographic areas executed this project in unity.

Table 3. Urban Stormwater Evaluation for One Selected Watershed Generic Plan Deliverables and Milestones

Deliverable or Milestone	Time Frame	Estimated Hours of Effort	Estimated Cost
Task No. 1 – Compile and Review Urban Stormwater Activities Information	Start: Month 1 Finish: Month 3	125	$10,300
Task No. 2 – Assess Existing Urban Stormwater Master Plans	Start: Month 1 Finish: Month 3	115	$8,800
Task No. 3 –Select Urbanized Watersheds for Evaluation of Regional BMPs	Start: Month 1 Finish: Month 2.5	110	$9,300
Task No. 4 – Compile and Review Storm Drainage Design, Operation, and Maintenance Criteria	Start: Month 2 Finish: Month 4	100	$9,600
Task No. 5 – Compile and Review Stormwater Quality Related Design, Operation, and Maintenance Criteria	Start: Month 2 Finish: Month 4	110	$10,000
Task No. 6 - Develop Criteria for Identifying BMP Constrained Areas Workshop No. 1; Technical Memorandum No. 1	Start: Month 3 Finish: Month 5	125	$10,300
Task No. 7 – Prepare Study Maps of Selected Watersheds	Start: Month 5 Finish: Month 7	110	$10,400
Task No. 8 – Evaluate Existing Conditions within Selected Watersheds	Start: Month 6 Finish: Month 7	230	$17,600
Task No. 9 – Evaluate Future Conditions within Selected Watersheds	Start: Month 7 Finish: Month 9	195	$15,900
Task No. 10 – Assess Adequacy of Sites and Evaluate Potential Regional BMPs	Start: Month 8 Finish: Month 10	680	$54,500
Task No. 11 – Complete General Assessment of Operation and Maintenance Requirements Workshop #2; Technical Memorandum #2	Start: Month 10 Finish: Month 11	115	$8,500
Task No. 12 – Report – Regional Stormwater BMP Plan for Selected Watersheds Draft Report Workshop #3 Final Report	Start: Month 11 Finish: Month 12	350	$23,800
Task No. 13 - Stakeholder Coordination	Start: Month 1 Finish: Month 12	265	$24,300
Task No. 14 – Manage the Project	Start: Month 1 Finish: Month 12	130	$11,700

The project deliverables will consist of:

- Technical Memorandums numbers 1 and 2
- Transcripts, in electronic file form, of flipchart notes of the Stakeholder Meetings
- Draft and Final Report

1.5 Schedule Including Key Milestones

Exhibit 1 presents the project schedule and key milestones.

1.6 Assumptions

- The stakeholder agencies will provide copies of pertinent information such as system maps, construction drawings, inspection data, monitoring data, master plans, study reports, O & M activities, and current and future studies.
- The stakeholder agencies will provide access to facilities and potential regional sites for inspection.
- Mapping information such as aerial photographs, GIS and CAD data is available in digital format.
- The stakeholder agency staff will be available to provide necessary effort into this planning effort.

1.7 Risks

- There is a risk that sufficient data to evaluate existing stormwater management facilities will not be readily available from project stakeholders and additional time will be required to gather and compile it (35% probability of risk occurring with a 20%± budget impact).
- There is also a risk that some stormwater management facilities slated for visual inspection will not be accessible due to weather conditions, or will be in a condition that is not sufficiently safe for a basic inspection, necessitating an extension of the period scheduled for inspections. This could, in turn, impact the overall project schedule (10% probability of risk occurring with a 10%± budget impact).
- There is a risk that a suitable base map is not available and a new base map will be required (15% probability of risk occurring with a 15%± budget impact).
- There is a risk that stakeholder agency staff will not be available to provide input into this planning effort (25% probability of risk occurring with a 30% budget impact).

1.8 Key Resource Requirements

Key resource requirements include:

a. Technical staff executing this study provided in Table 4
b. Corps project management and review by selected project staff
c. Technical review of project deliverables by the Scientific Advisory Group
d. Stakeholder participation in the three interactive workshops
e. Stakeholder agency assistance to the contractor in the provision of data, provision of copies of drawings and documents, and facilitation of site visits and facility inspection

Table 4. Technical Staff

Title	Resource	Phone

1.9 Constraints

The study is limited by the quality, quantity, and accessibility of existing information. This study may also be constrained with potentially new data or lacking data, the complex regulatory procedures for implementing stormwater projects within the Lake Tahoe basin, and the different local governing agencies and protocols.

1.10 Interrelated Projects

A large amount of related work has been completed and is continuing in Lake Tahoe. A significant portion of this effort will be specifically directed to the integration of other similar activities.

In addition to on-going projects, other activities that have the potential to affect the performance and/or results of the proposed study include:

- The development and implementation of other community and/or local agency master plans
- Other efforts to review, revise, or adopt design criteria or guidelines
- Other efforts to improve stormwater BMP O&M activities

1.11 Acceptance Criteria

Within the scope of work in section 3 above, work products must meet the benefit and implementability requirements of the Corps and valid requirements expressed by the stormwater managers and other stakeholders. This element will be accepted when the stakeholders are satisfied, the Science Advisory Group has agreed to the conclusions and content of the study and the legislative representatives are satisfied.

1.12 Stakeholders

Table 5. Stakeholders

Stakeholder	Contact	Address	Phone	E-Mail
Nevada Department of Transportation	Amir Soltani Bill Gall Theresa Jones	1263 S. Carson St. Carson City, NV 89712	(775) 888-7619	asoltani@dot.state.nv.us bgall@dot.state.nv.us tjones@dot.state.nv.us
California Department of Transportation	John Holder Dick Melim	2800 Gateway Oaks Drive #19 Sacramento, CA 95833	(530) 229-0524	john_holder@dot.ca.gov richard_melim@dot.ca.gov
Placer County Department of Public Works	Bob Costa Rebecca Bond Peter Kraatz	870 Cabin Creek Rd. Truckee, CA 96161	(530) 889-4000 (530) 906-5179	bcosta@placer.ca.gov rbond@placer.ca.gov pkraatz@placer.ca.gov
Washoe County	Kimble Corbridge Dick Minto	P.O. Box 1130 Reno, NV 89512	(775) 328-2041	kcorbrid@mail.co.washoe.nv.us dminto@mail.co.washoe.nv.us
El Dorado County	Bruce Lee Steve Kooyman	1121 Shakori Drive Meyers, CA 96150	(530) 573-3180	Blee@co.el-dorado.ca.us skooyman@co.el-dorado.ca.us
City of South Lake Tahoe	Brad Vidro Steve Peck	1900 Lake Tahoe Blvd. South Lake Tahoe, CA 96150-6323	(530) 542-6030	bvidro@ci.south-lake-tahoe.ca.us speck@ci.south-lake-tahoe.ca.us
Kingsbury General Improvement District	Candi Rohr	P.O. Box 2220 Zephyr Cove, NV 89448	(775) 588-3548	candi@kingsburygid.com
Round Hill General Improvement District	Cameron McKay	P.O. Box 976 Zephyr Cove, NV 89448	(775) 588-2571	rhgid@aol.com
Tahoe Regional Planning Agency	Matt Graham Rita Whitney Brendan Ferry Kevin Hill	P.O. Box 1038 Zephyr Cove, NV 89448	(775) 588-4547	mgraham@trpa.org rwhitney@trpa.org bferry@trpa.org khill@trpa.org
US Environmental Protection Agency	Jane Freeman	P.O. Box 1038 Zephyr Cove, NV 89448	(775) 588-4547	jfreeman@trpa.org
Lahontan Regional Water Quality Control Board	Laurie Kemper Robert Larson Jeremy Sokulsky	2501 Lake Tahoe Blvd. So. Lake Tahoe, CA 96150	(530) 542-5400	LKemper@rb6s.swrcb.ca.gov RLarsen@rb6s.swrcb.ca.gov sokuj@rb6s.swrcb.ca.gov
Nevada Division of Environmental Protection	Cliff Lawson Rob Saunders	333 West Nye Lane. Carson City, NV 89706	(775) 687-4670	clawson@ndep.state.nv.us rsaunders@ndep.state.nv.us
Nevada Tahoe Conservation District	Jason Drew	PO Box 10529 870 Emerald Bay Rd South Lake Tahoe, CA 96158	(530) 573-2757	Jason-drew@ca.nacdnet.org
Nevada Division of State Lands	Jim Lawrence	333 West Nye Lane Room 118 Carson City, NV 89706	(775) 687-4735	lawrence@govmail.state.nv.us
US Forest Service	Melanie Green Sue Norman	870 Emerald Bay Rd. South Lake Tahoe, CA 96150	(530) 573-2600	mgreen@fs.fed.us snorman@fs.fed.us
League to Save Lake Tahoe	Rochelle Nason	955 Emerald Bay Road S. Lake Tahoe, CA 96150	(530) 541-5388	rochelle@keeptahoeblue.org
Natural Resources Conservation Service	Paul Sweeney	870 Emerald Bay Road South Lake Tahoe, CA 96150	(530) 573-2764	Paul.Sweeney@ca.usda.gov
Tahoe Resource Conservation District	Jennifer Heath	870 Emerald Bay Road South Lake Tahoe, CA 96150	(530) 573-2754	Jennifer.Heath@ca.usda.gov

1.13 Quality Control And Quality Assurance

Internal review of contractor documents will be conducted in accordance with the contractor's quality assurance program and supporting technical procedure manuals. The contractor will be responsible for following the procedures and requirements of the Department of Defense such as:

a. 10 CFR 830.120

b. ANSI/ASQC E4-1994
c. DOE Order 5700.6C
d. EPA QA/R2
e. ASME NQA-1
f. ISO 9001

The Corps will be responsible for quality assurance of the contractor's quality control activities. Also, stakeholder participants in the three workshops to be held throughout the project will conduct informal review of Draft Technical Memoranda and the Draft Recommended Action Plan. Formal reviews are to be conducted by the Corps Project Manager.

1.14 Communication Plan

Successful execution of the Urban Stormwater Management Evaluation will require communication and coordination both within and among the work elements, along with timely, clear exchange of information with project stakeholders.

Most communication types and methods will be common to all work elements, as will the common goal of effective and efficient communication that documents project activities adequately.

Communication methods include those common to all work elements, as well as a series of interactive stakeholder workshops. These stakeholder meetings involving the Corps, the stormwater managers and selected other stakeholders will be conducted during the study. Sharing concise, clear, accurate information with and obtaining input from the stakeholders will be a critical link in successful execution of this element.

Updates on the progress on the study will be provided for meetings of the Lake Tahoe Basin Executive Committee and of the Federal Advisory Committee, the chairs of which will be kept informed by the Corps.

Weekly progress meetings or telephone conversations will take place between the Corps and the contractor throughout the study. The Contractor will provide a single point of contact for the Corps.

Documents: All documents will be produced in MS Word and, when transmitted electronically, will be in either *.doc or *.pdf format.

The Press: Any project team member approached by a member of the press shall refer them to the Corps Project Manager.

Letters and Memoranda: All correspondence will be routed through the Corps Project Manager or Work Element leaders, as appropriate.

Electronic Mail (E-mail): E-mail is an acceptable method of communication for informal correspondence. Documents may also be transmitted by e-mail, but hard copies of the final versions of all formal documents shall be mailed, unless otherwise requested by the Client.

Technical Data: The transmittal of technical data will always include a transmittal letter or explanatory e-mail. Work Element Leaders will be responsible for maintaining the repositories for all technical data, whether in hard copy or electronic format.

Meetings: Draft agendas will be prepared prior to each meeting, and copies will be distributed for comments in advance.

Conference Calls: Periodic conference calls will be convened as needed for coordination and communication among work elements and within work element teams. An agenda for conference calls will be prepared as needed and will be distributed in advance of the call by e-mail.

Meeting and Conference Call Summaries: Work Element Leaders will record a summary of decisions made in all meetings, conference calls, and other communications and furnish copies of written summaries to the Corps Project Manager. Team members are encouraged to keep their own detailed notes of meetings and conference calls. This record will be maintained in the project files.

Telephone Calls: When a telephone conversation with an outside party or with another Team member includes information that should be documented, the team member involved shall prepare a telephone call record, distribute the record to the other team members (e-mail is acceptable) and provide a hard copy of the record for the project files.

Faxes: Fax is an acceptable method of communication for informal correspondence. The fax header shall include the date, name and phone number of the sender, the name and fax number of the receiver, the project name and number, the number of pages sent, and the names of the individuals receiving copies.

Use of Filing System: Efficient access to project information will be maintained through use of a project filing system. Team members may keep their own files, however, a copy of all communications, items, and information prepared or gathered as part of this study shall be filed in central filing system for each Work Element and copied to Corps Project Management.

1.15 Change Management Plan

The contractor shall not depart from or perform work beyond this scope of work, or change criteria upon which this scope of work is based without written direction and/or consent from the Contracting Officer with the Corps. The contractor should not take guidance from any other agency during this study that deviates for this scope of work unless directed by the Contracting Officer. The contractor shall immediately notify the Corps Point of Contact, the Contracting Officers Representative, or the Contracting Officer of any requests.

The contractor shall identify a Project Engineer/Project Manager who is to report to the Project Manager of the Corps. The Corps Project Manager shall be notified by the contractor of any change of Project Engineer/Project Manager.

1.16 References

Goldman, C.R. 1974. Eutrophication of Lake Tahoe, Emphasizing Water Quality. EPA-660/3-74-034, U.S. Govt. Printing Office, Washington D.C.

USDA Forest Service, 2000, Lake Tahoe Watershed Assessment. Pacific Southwest Research Station, USDA Forest Service in collaboration with the Tahoe Regional Planning Agency, the University of California at Davis, and the Desert Research Institute, Reno, Nevada.
Tahoe Research Group. 2001. Annual Progress Report. UC Davis, Davis, CA.

Rowe, T.G., Saleh, D.K., Watkins, S.A., Kratzer, C.R., 2002 Streamflow and Water Quality Data for Selected Watersheds in the Lake Tahoe Basin, California and Nevada, through September 1998, U.S. Geological Survey Water Resources Investigations Report 02-4030, Carson City Nevada, 2002

EXHIBIT 1

PROJECT SCHEDULE AND KEY MILESTONES

ID	Task Name	Start Date	Finish Date
1	Task No. 1--Compile and Review Urban Stormwater Activities	Month 1	Month 3
2	Task No. 2--Assess Existing Urban Stormwater Master Plans	Month 1	Month 3
3	Task No. 3--Select Urbanized Watersheds for Evaluation of Regional BMP's	Month 1	Month 2
4	Task No. 4--Compile and Review Storm Drainage Design, Operation, and Maintenance Criteria	Month 2	Month 4
5	Task No. 5--Compile and Review Stormwater Quality Related Design, Operation, and Maintenance Criteria	Month 2	Month 4
6	Task No. 6--Develop Criteria for Identifying BMP Constrained Areas	Month 3	Month 5
7	Technical Memorandum #1	Month 5	Month 5
8	Task No. 7--Prepare Study Maps of Selected Watersheds	Month 5	Month 7
9	Task No. 8--Evaluate Existing Conditions within Selected Watersheds	Month 6	Month 7
10	Task No. 9--Evaluate Future Conditions within Selected Watersheds	Month 7	Month 9
11	Task No. 10--Assess Adequacy of Sites and Evaluate Potential Regional BMP's	Month 8	Month 10
12	Technical Memorandum #2	Month 11	Month 11
13	Task No. 11--Complete General Assessment of Operation and Maintenance Requirements	Month 10	Month 11
14	Task No. 12--Regional Stormwater BMP Plan for Selected Watersheds	Month 11	Month 12
15	Draft Report	Month 11	Month 11
16	Final Report	Month 12	Month 12
17	Task No. 13--Stakeholder Coordination	Month 1	Month 12
18	Stakeholder Meeting #1	Month 5	Month 5
19	Stakeholder Meeting #2	Month 10	Month 10
20	Stakeholder Meeting #3	Month 12	Month 12
21	Task No. 14--Manage the Project	Month 12	Month 12

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EXHIBIT 2

Subject: Response to Comments – Lake Tahoe Urban Stormwater PMP

This document provides the response to the comments received for the Lake Tahoe Urban Stormwater Project Management Plan (PMP). Comments were received from:

Lake Tahoe Scientific Advisory Group (SAG)	June 21, 2002
Lahontan Regional Water Quality Control Board	June 12, 2002
Nevada Tahoe Conservation District	May 21, 2002

Each comment is presented below for reference and is followed by the response in italics.

COMMENTS BY THE LAKE TAHOE SCIENCE ADVISORY GROUP (SAG), June 21, 2002

Comment: The SAG felt strongly that the Project Management Plan (PMP) should build on existing efforts and not direct activities in the Basin. There are many efforts that currently are being funded by many agencies related to stormwater management and it is critical this PMP is well integrated into these projects. The general tone of the document implied that this plan may serve to educate the Army Corp of Engineers (ACOE) more than the Basin stakeholders. The plan is written as if the ACOE has authority to implement and direct projects instead of providing a service to the Basin agencies and the public. For staffs of the various agencies to commit time and resources, they must see the value of this service and how it builds on existing efforts.

Response: *Clarification has been added to the Executive summary to explain where direction for PMP came from.*

The Corps developed this PMP reflecting input received from potential sponsors, both at the executive and staff level. The primary direction was to focus the work of this PMP on the following two aspects of urban stormwater management within the Lake Tahoe Basin:

- *Assess the current status of urban stormwater master planning in the Lake Tahoe basin in comparison to state-of-the-art within the industry*
- *Evaluate site specific BMP issues as identified by non-Federal study partners in the projected 3-4 study areas*

The U.S. Army Corps of Engineers (Corps) enters into partnerships with non-federal sponsors (sponsors) to develop and manage projects for which there are a mutual interest. The sponsors share in the financial costs of studies and projects; and provide input regarding budget, scope, quality, and schedule. If the sponsors do not see value added, they rarely enter into an agreement.

In this instance, the Corps is responding to a need expressed by a coalition of agency and community leaders. If SAG believes that the Urban Stormwater Management Plan study should be a low priority, now is a good time for that input to be provided to that coalition. We recommend providing that input through either TRPA or the Basin Executives. In this manner, the study, which is as yet unfunded, can be deferred or modified in scope.

Comment: Several reviewers asked the question if ACOE could sub-contract with agencies or consultants currently monitoring and implementing stormwater management projects to add value to current efforts. The PMP does not currently mention these efforts underway with the 6 agencies mentioned. For example, the TMDL effort led by the Lahontan Regional Water Quality Control Board is not mentioned nor is the over $3 million dedicated to stormwater work that the Tahoe Regional Planning Agency and Lahontan received from the States of California and Nevada last year to study the intervening areas and assess BMP effectiveness of stormwater projects.
Response: *The Corps contracts project related services depending upon the specific situation and needs of a project. In the majority of projects, the Corps follows an established competitive process is when procuring services.*
Task 1 of the PMP acknowledges that numerous related activities are underway in the Basin. As stated, existing information and activities will be reviewed for use in completing the activities under this PMP. This study will not unilaterally duplicate the work being done by others in the basin. No change in PMP proposed.
It is not known when or if this PMP will be implemented. Prior to commencing work a review will be completed current to that date to avoid duplication of efforts.

Comment: Some tasks outlined in the PMP are currently being funded by Lahontan (Tasks 2,3). For example, the Basin Executives Stormwater Quality subgroup is taking on issues related to stormwater drainage design, operation and maintenance criteria through the help of a consultant, Ed Wallace (Tasks 4,5,6). It also appears that tasks 4 and 5 are one in the same.
Response: *Completing the tasks under this PMP will draw heavily upon the work of previous and current activities, as stated in the PMP. The tasks as envisioned do not duplicate the work being done by others. No change in PMP proposed.*
Task 4 deals with criteria relating to the conveyance of stormwater. Task 5 deals with criteria relating to the improvement of stormwater quality.

Comment: Generally, the PMP looks at BMPs as a treatment option and not as a source control option. While treatment of stormwater is crucial, the current approach incorporates source control and capacity as the primary drivers of site selection of constrained areas. There could be less of a need for BMPs that treat stormwater if the flow can be reduced in the first place.
Response: *Philosophically concur, however, source control, such as implementing backyard or commercial BMPs on an accelerated pace are beyond the scope of this effort. This study was limited to technological rather than regulatory solutions. To a certain extent, source issues should be addressed as part of Tasks 2, 3, and 4. However, it is anticipated that the regional BMPs will focus on treatment. No change in PMP proposed.*

Comment: There was confusion on what was meant by regional and regional site BMPs. Currently there is work being funded by Lahontan to Eric Strecker to look at this topic. There was uncertainty about what specific sites that were mentioned and whether a regional BMP approach was appropriate for Tahoe. There is mention of a regional map delineating watershed areas and prioritizing the watershed of interest. There are no criteria of how this ACOE prioritization will occur.

Response: *Priority will not be set by the Corps, but by the needs identified by the non-Federal Sponsor, usually the authority responsible for Stormwater discharge. For purposes of this PMP, regional BMPs are defined as those that will be located to treat runoff from an entire drainage area(s) and that will be planned, designed, constructed, operated, and maintained by the responsible agency and paid for with public funds.*
Criteria for prioritization will be established with responsible agencies and sponsors under Task 3, as discussed. No change in PMP proposed.

Comment: All reviewers felt that assessment of operation and maintenance requirements (task 11) may be one of the most important contributions made by this study, yet it has the smallest budgeted amount to complete this task. Currently a large gap exists in our understanding and coordination of this topic. It was suggested that funds from other tasks outlined in the PMP be diverted to this task to make it more substantial than a reconnaissance level survey. This is a great opportunity to have an independent agency take the lead of developing an alternatives analysis for implementing and funding a regional O & M program for stormwater treatment facilities, conveyance systems and equipment.
Response: *The Corps developed this PMP reflecting input received from potential sponsors, both at the executive and staff level. The primary direction was to focus the work of this PMP on the following two aspects of urban stormwater management within the Lake Tahoe basin:*

- *Assess the current status of urban stormwater master planning in the Lake Tahoe basin in comparison the industry state-of-the-art*
- *Evaluate site specific best management practice (BMP) issues as identified by non-Federal study partners in the projected 3-4 study areas*

O&M life cycle costs will be used as significant criteria for BMP evaluation during the Corps study. In accordance with the previously stated goal of not duplicating the work by others, and given O&M is being studied by others, O&M will not be a primary study task. No change in PMP proposed.

Comment: Along these same lines, the need to look at the design criteria (20-year, 1-hour storm for example) for projects is needed in the Basin. Currently these guidelines measure intensity and not improving quality of projects and stormwater. This PMP could provide information relative to the maximum expected load over the life of the stormwater management plan, including some worse case scenarios. In addition, the PMP could evaluate treatment options based on a design storm event and the type of BMP used. Ideally the agencies would have a "suite" of BMPs to choose from based on information provided from this PMP.
Response: *Overall Stormwater criteria were not included as a primary task for the scope. In general, these issues will be addressed in completing Tasks 4, 5, 6, and 10. No change in PMP proposed.*
Incidentally, the Corps has requested FY03 funds to develop the types of criteria described above. Funds have not been appropriated to date.

Comment: The workshop and meeting schedule seemed ambitious and perhaps redundant. All reviewers expressed concerns of attending additional meetings. There are currently many

working groups dealing with this topic and it was suggested that ACOE staff attend these meetings to gather input and present on this topic rather than creating new meetings. Review time should be a minimum of 4 weeks instead of 2-4 weeks.
Response: *The schedule for workshops, meetings, and technical memorandums will be modified at the time of execution, as appropriate to meet local non-Federal sponsor expectations. The idea of utilizing existing working groups is excellent and can be implemented at that time. The PMP will be revised to reflect a review time of 4 weeks.*

Comment: Page 4, last paragraph: insert "serious attempts are not made within the ten years to control after "Some scientists have concluded that if"…
Response: *Disagree. These statements were taken directly from the USDA Lake Tahoe Watershed Assessment: Volume 1, May 2000. In the cause of uniformity it is proposed to leave the PMP text unchanged.*

Comment: Page 4, same paragraph: delete "are not reversed within the next ten years".
Response: *Disagree. These statements were taken directly from the USDA Lake Tahoe Watershed Assessment: Volume 1, May 2000. In the cause of uniformity it is proposed to leave the PMP text unchanged.*

Comment: Page 4, same paragraph: insert "the lake reach a new equilibrium based on" after "It may take up to thirty years to see".
Response: *Disagree. These statements were taken directly from the USDA Lake Tahoe Watershed Assessment: Volume 1, May 2000. In the cause of uniformity it is proposed to leave the PMP text unchanged.*

Comment: Page 4, same paragraph: delete "changes in the clarity that result from immediate"
Response: *Disagree. These statements were taken directly from the USDA Lake Tahoe Watershed Assessment: Volume 1, May 2000. In the cause of uniformity it is proposed to leave the PMP text unchanged.*

Comment: Page 4, same paragraph: insert "and sediment loads" and delete "going into the Lake"
Response: *Disagree. These statements were taken directly from the USDA Lake Tahoe Watershed Assessment: Volume 1, May 2000. In the cause of uniformity it is proposed to leave the PMP text unchanged.*

Comment: That sentence should read: It may take up to thirty years to see the lake reach a new equilibrium based on reduction of nutrient and sediment loads.
Response*: Concur. This statement will be added.*

Comment: Page 6, last paragraph: Does not follow text in first paragraph of next page, i.e. local counties, GIDs are not responsible for setting numerical discharge limits.
Response*: Concur. This has been corrected.*

Comment: Page 7, last paragraph: Change Tahoe Research Group to University of California, Davis-Tahoe Research Group
Response*: Concur. This has been corrected.*

Comment: Page 7, last sentence: delete "regulating and"
Response: *Concur. This has been corrected.*

Comment: Page 7, next sentence: delete "establishing numerical discharge limits, the", (the following 4 groups do not set discharge limits)
Response: *Concur. This has been corrected.*

Comment: Page 9, paragraph 3: PMP indicates this task will assess plans of the four agencies. Not clear what four agencies the PMP is referring to.
Response: *Concur. It will be stated as three agencies – City of South Lake Tahoe, Placer County, and Washoe County. These three agencies have jurisdiction over the majority of the urbanized areas within the Lake Tahoe basin. This does not limit other agencies/entities from participating if they so chose. This plan can easily be modified to fit other urbanized areas within the Lake Tahoe basin (i.e. Stateline, Douglas County, etc).*

Comment: Page 10, paragraph 3: List criteria for how the ACOE prioritization will occur. It should not conflict with previous prioritization maps.
Response: *The criteria will be developed in consultation with the agency personnel and potential project non-Federal sponsors. It is assumed that this prioritization would not conflict with previous prioritizations, but this cannot be guaranteed.*

Comment: Page 11, last paragraph: insert "and water quality scientists" after agency personnel
Response: *Concur. This has been added.*

Comment: Page 15, last sentence: "Identify a recommended regional BMP for each site". Unclear about which sites PMP is referring to (the word "each"). Confusion on the term "regional BMP sites".
Response: *Regional sites will be based on needs identified by non-Federal sponsors for the study. For purposes of this PMP, regional BMPs are defined as those that will be located to treat runoff from an entire drainage area(s) and that will be planned, designed, constructed, operated, and maintained by the responsible agency and paid for with public funds. Regional BMPs will be assessed for the watersheds selected under Task 3. No change in the PMP text is proposed.*

Comment: Page 18, first paragraph: The plan allows for a two-week review period for SAG. Four-week minimum with 4-6 weeks suggested.
Response: *Concur. A four-week review period has been added.*

Comment: Page 21, paragraph 4: Indicates, "The stakeholder agency staff will be available to provide necessary effort into this planning effort". It is possible; even likely, that agency staff there is a significant risk that agency staff will not be available to provide input into this process.

Response: *This probability of risk has been increased in the PMP. Again, the agency's input would be crucial for the success of this plan.*

Comment: Tasks 5, 6, 8, 9, 10, 11 require considerable expertise in civil engineering, hydrology, and geology together with familiarity with the frequency, duration, intensity, and impacts of storm events in alpine settings. Also, familiarity with current research in design and performance of stormwater facilities. It would be helpful to list the team assembled and their various expertise and roles with this project.
Response: *Concur, however, since the specific project site and requirements have not been identified, listing desired resources is deferred until the study is initiated. It is agreed that expertise within these fields are required for the success of this PMP. If and when this PMP is executed a list of the team members, roles, and expertise would be included.*

COMMENTS FROM LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD, June 12, 2002

Comment: The variety of tasks in the Draft PMP seems too broad in scope. Rather than take a general, broad-brush approach at a multitude of topics, the project should focus on one or two specific topics. It seems that this effort should focus on either providing good data for future watershed master planning or specifically develop a model watershed plan.
Specifically, the PMP needs more detail regarding (1) information to be gathered, (2) assessment and analysis techniques, (3) draft criteria for assessing options, and (4) more details on what specific task products will be.
Response: *Disagree. This level of detail is typical for management of professional services contracts of this sort. Philosophically, one could chose to spend the resources to define the level of detail requested in the comment, however, this could have the effect of stifling the creativity or risk having a project team that executes the detail scope by rote.*
The Corps developed this PMP reflecting input received from potential sponsors, both at the executive and staff level. The primary direction was to focus the work of this PMP on the following two aspects of urban stormwater management within the Lake Tahoe basin:

- *Assess the current status of urban stormwater master planning in the Lake Tahoe basin in comparison to state-of-the-art within the industry*
- *Evaluate site specific best management practice (BMP) issues as identified by non-Federal study partners in the projected 3-4 study areas*

Comment: We are aware that this project is part of a larger Army Corps project and planning process, however, we are concerned that the proposed project will have considerable overlap with existing research and will not provide a great deal of new information. A review of current research efforts would help narrow the focus of the PMP toward those questions that are not already being addressed in other studies. In order to provide the most useful information, we encourage you to consult directly with our BMP contractor (Eric Strecker with Geosyntec) and other local researchers during the development of this PMP to avoid overlap and ensure useful collaboration.

Response: *Concur. A review of current activities will be completed under Task 1. When and if this PMP is implemented a review of activities will be completed and the scope of work will be adjusted as appropriate to avoid duplication of efforts.*

Comment: Page 7, third bullet list - agencies that provide funding, technical oversight, and planning for EIP projects. The Lahontan Regional Water Quality Control Board should be added to this list.
Response: *Concur. The Lahontan Regional Water Quality Control Board has been added to the list.*

Comment: Page 8, last bullet – "…focuses on traditional regional BMPs and non-traditional BMPs were required due to site constraints." Change "were" to "where." Need to define traditional vs. non-traditional BMPs. Because "traditional" BMPs (we assume you mean treatment basins, infiltration facilities, etc.) have been and are currently being monitored and evaluated, the PMP should focus on "non-traditional" BMPs (wastewater treatment technologies, flocculants, active filter methods, etc.)
Response*: Concur. The spelling corrections have been made.*
Examples of non-traditional BMPs were presented under Task 10. The PMP is written to focus on the most appropriate type of regional BMP for the site conditions. It is anticipated that many of the sites of interest to the sponsors will require non-traditional approaches.

Comment: Page 9, Task 1 – Compile and review urban stormwater information and activities. The Tahoe Research Group as part of a Clean Water Act 205j grant project has done this. The final report was published November 30, 2001. Due to the wide range of sampling collection methods, analyzed constituents, and BMPs evaluated, existing stormwater information is somewhat inconclusive. Current efforts are underway to comprehensively measure stormwater runoff from various land uses and assess the effectiveness of existing BMPs. The November 30, 2001 report referenced above thoroughly covers historical BMP research and monitoring efforts. If Task 1 is to be pursued, it should include a list of the agencies that would be contacted, how the contact would occur, and more specifics on what information would be obtained. Finally what is the product? An annotated bibliography?
Response: *Concur. The referenced reports and activities are the type of material that will be reviewed under Task 1. The agencies to be contacted will be established in conducting this Task. The product for Task 1 is the information required by the contractor to execute the rest of the study. The product would not stand-alone.*

Comment: Page 9, Task 2 – Overview of existing and future storm drainage and water quality problems and needs and overview of existing and future capital improvement and operation and maintenance programs. With the exception of operations and maintenance review, others have accomplished most of this task. The PMP should focus on reviewing operation and maintenance programs and assess the need for comprehensive urban stormwater master plans.
Response: *Disagree. Others are studying O&M. This study will avoid duplicating the work of others. The Corps developed this PMP reflecting input received from potential sponsors, both at the executive and staff level. The primary direction was to focus the work of this PMP on the following two aspects of urban stormwater management within the Lake Tahoe basin:*

- *Assess the current status of urban stormwater master planning in the Lake Tahoe basin in comparison to state-of-the-art within the industry*
- *Evaluate site specific best management practice (BMP) issues as identified by non-Federal study partners in the projected 3-4 study areas*

O*&M life cycle costs will be used as significant criteria for BMP evaluation during the Corps study. In accordance with the previously stated goal of not duplicating the work by others, and given O&M is being studied by others, O&M will not be a primary study task. No change in PMP proposed*.

Comment: Page 10, Task 3 – "The purpose of this task is to identify the urban watershed that this study will focus on." The task takes a broad-brush approach toward identifying high-risk watersheds and should be more narrowly defined. Some example criteria would be helpful. Perhaps ranking could based on potential pollutant load contributions? What is the expected product of this task (e.g. listing of watersheds with criteria ratings)?
Resource managers have a general idea of problem areas within the basin, including those listed in the task (i.e. the biggest urban centers). The PMP should focus on identifying specific locations on a sub-watershed scale where "traditional" BMPs are not feasible due to site constraints with emphasis placed on those areas with direct hydraulic connectivity to Lake Tahoe or tributary waters.
Response: *Disagree in part. As stated in Task 3, identification of the selected watershed(s) will rely heavily upon input from potential sponsors. If desired by the sponsors, the criteria will include focusing on constrained sites. The outcome of this Task would be the identification of a watershed(s) for which the sponsors have a particular interest in evaluating and which will be studied in more detail. No change in text is proposed.*

Comment: Page 11, Task 4 – "Compile and review storm drainage design, operation, and maintenance criteria." Again, the scope of the task may be too broad. How are you defining "criteria?" Will the project look at sweeping frequency, basin and drop inlet cleaning schedules, etc.? The task seeks to "establish criteria for use in this study." What does this mean? What will the "criteria" be used for?
Response: *Criteria are defined as established practices and parameters that are used locally to generally define a successful BMP. These criteria will come from the responsible agency/sponsor and regulatory agencies. These criteria will be evaluated and compared with other agencies, both in the Tahoe Basin and in the industry as a whole.*
O*&M life cycle costs will be used as significant criteria for BMP evaluation during the Corps study. In accordance with the previously stated goal of not duplicating the work by others, and given O&M is being studied by others, O&M will not be a primary study task. No change in PMP proposed*.
Criteria will be established based on the existing information from the responsible agency/sponsor and regulatory agencies. These criteria will be used for the evaluation/recommendations of regional BMPs in tasks 6 through 10.

Comment: Page 11, ~~Task 4~~ *Task 5* – "Compile and review stormwater quality related design, operation, and maintenance criteria." The problem of consistent design standards is a project in and of itself. Again, this task seems to lack focus with an unclear goal of "establish criteria for use in this study." What is the purpose of the review? Identify specific aspects of design, operation, and maintenance to be completed to prevent overlapping with separate efforts.
Response: *The purpose of this review is to have a list of accepted practices to review and/or design regional water quality BMPs. These criteria would come from the regulatory agencies. Overlapping with separate efforts would be avoided in part due to Task 1 and Task 2.*

Comment: Page 11, Task 5 – This task could be combined with Task 4. As noted for other tasks, the "criteria" need to be more clearly defined. What will the "criteria" be used for? Expected product of this task?
Response: *Task 4 focuses on storm drainage (conveyance of stormwater) while Task 5 focuses on water quality (treatment). The criteria will be used for the evaluation in Tasks 6 through 10. The expected product of this Task is the ability to evaluate and recommend regional BMP's to meet the regulatory agencies requirements in the Lake Tahoe basin.*

Comment: Page 12, Task 6 - State how BMP limited areas will be defined. Although some example criteria are given, there is no discussion about what evaluation methods or tools will be used. It seems the maps to be collected in Task 7 will be needed before constrained areas can be identified. Limiting factors may include infiltration potential, topography (e.g., can you get stormwater there), and existing infrastructure (what is in the way, etc.). It seems like that the focus of this task should be looking at catchments for retro-fit opportunities vs. constraints.
Response: *A start to the evaluation tools or methods would come from Tasks 4 and 5, the storm drainage and water quality criteria (the Task numbers have been corrected in this task – it was listed as Task 5 and 6). The local agency/sponsor would identify these constrained areas. Once these areas are identified, mapping would commence.*
Retrofit opportunities would be identified in Tasks 8 through 10. A bulleted item has been added under Task 10 in the PMP to identify retrofitting as an alternative.

Comment: Page 13, Task 7 – This task should be accomplished earlier in the project. What specific information will the project collect? What specific products (GIS layers, etc.) will the project seek to find and/or create? Stormwater related GIS information for the Lake Tahoe basin is limited. The task relies on "existing information" that may not be readily available unless this task is delayed 1-2 years.
Response: *Task 7 will identify and map the selected watershed(s). Existing BMPs and conveyance system will also be collected and mapped as appropriate. Tasks in this PMP are not strictly linear in execution. The mapping will provide basic information for use in assessing the regional BMP sites. GIS is not required for this study, but can be used if deemed beneficial to the project. No new GIS layers are anticipated. Any new data collected during the mapping process can be evaluated, and if appropriate, given to TRPA or other agencies for implementation into their GIS databases.*
As stated in Task 7, mapping information of interest to this plan includes topography, soils, existing stormwater drainage facilities, etc. It is understood that this information is available,

although not necessarily in digital or GIS format.

Comment: Page 14, Task 8 – Activities include assessing the "adequacy" of existing drainage facilities and BMPs based on available effectiveness data. How will "adequacy" be assessed? Will you be using percent pollutant removal or effluent water quality to determine if existing facilities are "adequate?" What water quality standards will be used? As noted above, existing BMP effectiveness data are somewhat inconclusive due to site-specific conditions and inconsistent sampling and analytical methods. The task also lists "visual observations" as a method for assessing "adequacy." Visual observations can be subjective; a well-planned monitoring program based on water quality sampling is the best way to evaluate BMP effectiveness. How does this task differ from Task 6?
Response: *Task 6 and 7 develops the criteria (and adequacy) that will be used to determine if an area is BMP constrained and a non- traditional approach will be required. Adequacy of existing drainage facilities will be discussed with agency personnel to identify conveyance or flooding issues, if any. Existing regional BMPs will be identified and based on existing effectiveness data, BMP adequacy will be discussed. The water quality standards used to evaluate the effectiveness of these BMPs will come from the regulatory agencies.*
Visual observations may be used as a method for assessing adequacy by identifying conveyance systems, existing BMPs, damage to BMPs, possible size constraints, etc.
This study will not evaluate sampling and analytical methods. Others are currently performing this sampling and analytical evaluation. Stormwater data, if available, may be evaluated to assess the adequacy of regional BMPs.
Task 8 involves assessing the existing conditions within a watershed that was selected for study under Task 3. The assessment will be based upon discussion with agency staff and available information.

Comment: Page 15, Task 10 – There is a great body of research dedicated to BMP effectiveness. How will this task "Evaluate Potential Regional BMPs"? What measure of success will be used? Like all tasks, a more clearly defined goal is needed. Assessing BMP effectiveness is an enormous undertaking.
Response: *The design criteria will be used to determine if the site is BMP constrained and to complete the preliminary design of an appropriate regional BMP.*

Comment: Page 16, Task 11 – Complete general assessment of operation and maintenance requirements. What standards will be used for assessment? Will measurable water quality improvements be considered? As with all tasks, we recommend clearly defining what standards will be used to "generally assess" BMPs or maintenance practices.
Response: *This task does not include a technical assessment, but rather, includes a general assessment based on discussions with knowledgeable personnel for the sole purpose of determining if an interest exists for further investigating the benefits of agencies combining their operation and maintenance activities.*

Comment: Page 17, Task 12 – Report: Urban stormwater management plan. The task discussion suggests a comprehensive plan for reducing sediment and nutrient inputs from urban watersheds. This task overlaps with current efforts by Regional Board consultants working on

developing Total Maximum Daily Loads. Specifically, Eric Strecker with Geosyntec is evaluating existing BMPs, the potential for improved design and maintenance of existing facilities, and the potential for new technologies to reduced nutrient and sediment loads associated with urban runoff. Please contact Dave Roberts at our office for additional details regarding current stormwater research funded by the Regional Board to avoid overlap.
Response: *The PMP has been modified.*

Comment: Page 21, Assumptions – "Mapping information such as aerial photographs, GIS, and CAD data is available in digital format." This may be an incorrect assumption. Although some GIS and remote sensing data are available, existing information is limited.
Response: *TRPA and USGS have useful maps, but existing information may be limited. Mapping is included as a Risk; the probability and budget impact will be increased.*

COMMENTS BY NEVADA TAHOE CONSERVATION DISTRICT, May 21, 2002

Comment: Page 7, First set of bullets.
In Douglas County all implementation and O+M is the responsibility of General Improvement Districts, Sanitation Districts, and Homeowners Associations (this includes Round Hill and KGID but also many others).
Response: *Concur. This bulleted list has been extended to identify Homeowners Associations and Sanitary Improvement Districts.*

Comment: Page 7, Third set of bullets.
The Nevada Tahoe Conservation District should be added to the list of funding, technical oversight, and planning agency.
Response: *Concur. The Nevada Tahoe Conservation District has been added to the list.*

Comment: Page 10, Task 3, paragraph 2. One of the four locations identifies South Lake Tahoe. Does this include Stateline, KGID, Round Hill GID, Oliver Park GID, Douglas County, El Dorado county, etc. or just the City of South Lake Tahoe itself.
Response: *The PMP could likely be modified to include any agency that is responsible for urban stormwater management in the Lake Tahoe basin and would potentially be interested in partnering with the Corps on the project.*

Comment: Page 11, Task 5, paragraph 1
When reviewing operation and maintenance design, operation, and maintenance be sure to include man hours needed, total costs, and equipment needed as O+M is a huge factor in project success.
Response: *This plan would look at operation and maintenance (O&M) in a general sense. This plan would not develop this level of detail.*

Comment: Overall-
When using the term regional what does that entail? An entire county or just several watersheds?

Response: *For the purposes of this PMP, regional BMPs are defined as those that will be located to treat runoff from an entire drainage area(s) and that will be planned, designed, constructed, operated, and maintained by the responsible agency and paid for with public funds.*